HEALTHCARE COST AND UTILIZATION PROJECT

Agency for Healthcare Research and Quality

STATISTICAL BRIEF #209

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Geographic Variation in Hospital Inpatient List Prices in the United States, 2013

Zeynal Karaca, Ph.D., and Brian Moore, Ph.D.

Introduction

In the United States, each hospital has a chargemaster that contains the hospital's own list prices for all billable procedures and services performed at the hospital. Chargemasters use codes from the American Medical Association's Current Procedure Terminology system and the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure system.[1] Hospital list prices, reported as charges in the Healthcare Cost and Utilization Project (HCUP) databases, reflect the amount the hospital billed for the entire hospital stay, usually excluding professional (physician) fees, and vary across hospitals and markets.[2]

Hospitals periodically update the list prices in their chargemasters to account for new procedure codes and changes in their operating costs, expected payer mix, expected service mix, and volumes.[3] As a result, there might be substantial variation in charges for many individual items within the chargemaster over time and across hospitals and markets.[4,5]

Major public and private insurance providers negotiate a discount from the list prices with hospitals. Actual payments to hospitals by public and private payers are generally much lower than their reported list prices and are typically adjusted by an area wage index (AWI) to account for geographic variation across regions in labor costs, which represent a component of pricing that is to some degree beyond the hospital's control. Hospitals across different regions might experience sizable differences in reimbursement because of these AWI adjustments.

Highlights

- In 2013, there was substantial variation in hospital inpatient list prices, reported as charges, across U.S. census divisions.
- After adjustment for the area wage index (AWI), the mean charges per inpatient stay in most U.S. census divisions were closer to national means across all payer groups.
- The AWI-adjusted mean charges per inpatient stay were $39,000 for all stays, $47,100 for Medicare stays, $30,000 for Medicaid stays, and $35,200 for privately insured stays.
- Compared with the national average, the AWI-adjusted mean hospital inpatient charges per Medicare stay were 16 percent higher in the West South Central division, 15 percent higher in the Mountain division, and 14 percent higher in the Pacific division.
- In the Pacific division, the AWI-adjusted mean charges per Medicaid stay were 11 percent higher than the AWI-adjusted national Medicaid mean charges.
- In the West South Central division, the AWI-adjusted mean inpatient charges per privately insured stay were 16 percent higher than the AWI-adjusted national privately insured mean charges.
- In the New England, East North Central, and West North Central divisions, the AWI-adjusted mean charges for all stays, Medicare stays, Medicaid stays, and privately insured stays were lower than their corresponding AWI-adjusted national mean charges.

[1] Tompkins CP, Altman SH, Eilat E. The precarious pricing system for hospital services. Health Affairs. 2006 Jan 1;25(1):45–56.
[2] For more details, see Charges in the Definitions section or the NIS Description of Data Elements entry for TOTCHG at http://hcup-us.ahrq.gov/db/vars/totchg/nisnote.jsp. Accessed August 3, 2016.
[3] Tompkins et al., 2006. Op. cit.
[4] Reinhardt, UE. The pricing of U.S. hospital services: chaos behind a veil of secrecy. Health Affairs. 2006 Jan 1;25(1):57–69.
[5] Sanger-Katz M, Thomas K. Data shows large rise in list prices at hospitals. The New York Times. 2015 Jun 1. http://www.nytimes.com/2015/06/02/business/medicare-payments-billing-hospitals-doctors.html. Accessed August 3, 2016.

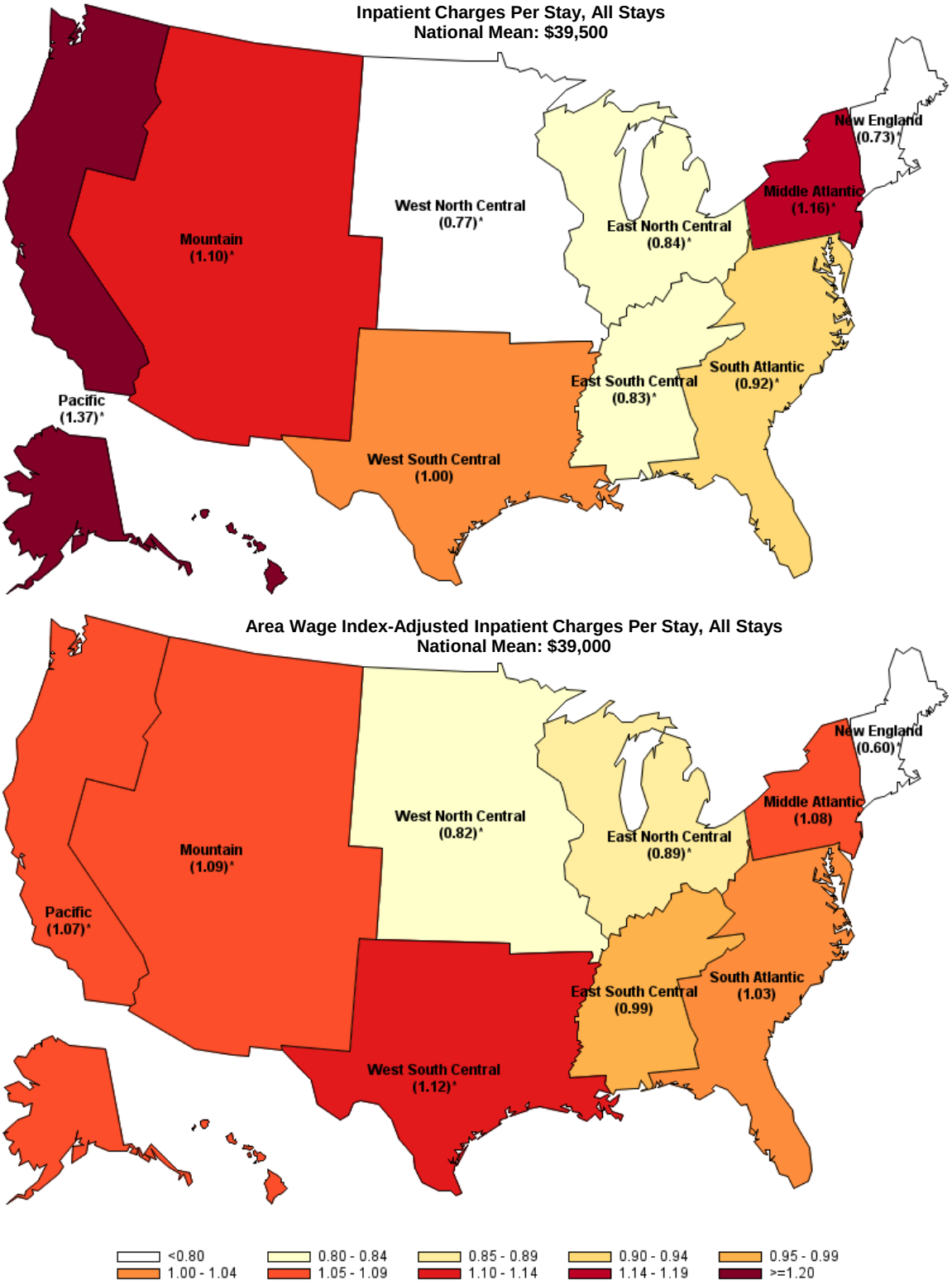
This HCUP Statistical Brief presents variation in charges for inpatient stays in the United States in 2013. The variation in charges adjusted by an AWI[6] also is presented to provide potential insight into the extent to which AWI adjustment accounts for geographic variation in hospitals' list prices. Mean charges per inpatient stay (with and without AWI adjustment) are calculated for each of the nine U.S. census divisions for all payers, Medicare, Medicaid, and private insurance. For each payer group, mean charges in each census division then are divided by mean charges nationally, and ratios are presented in maps to estimate the direction and magnitude of the difference in mean charges between each division and the nation as a whole. Ratios with values greater than 1.0 indicate divisions with mean charges that are greater than the national mean; values less than 1.0 indicate divisions with mean charges that are less than the national mean. All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

Findings

Mean inpatient charges for all payers, by census division, 2013
Figure 1 displays the ratios of U.S. census division-level mean charges relative to the national mean values per inpatient stay for all payers. In the top map charges are unadjusted, and in the bottom map charges are adjusted by the AWI.

[6] Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2013. Rockville, MD: Agency for Healthcare Research and Quality. Updated October 2015. http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed January 25, 2016.

Figure 1. Ratio of mean inpatient charges per stay relative to the national mean by census division, unadjusted and adjusted by area wage index, 2013



*Statistically significant difference from 1.00 at the 0.05 level or better

Note: Divisions are color-coded to represent 5 percentage point bins above or below the national mean value.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2013

- **There was substantial variation in mean inpatient charges per stay across census divisions in 2013.**

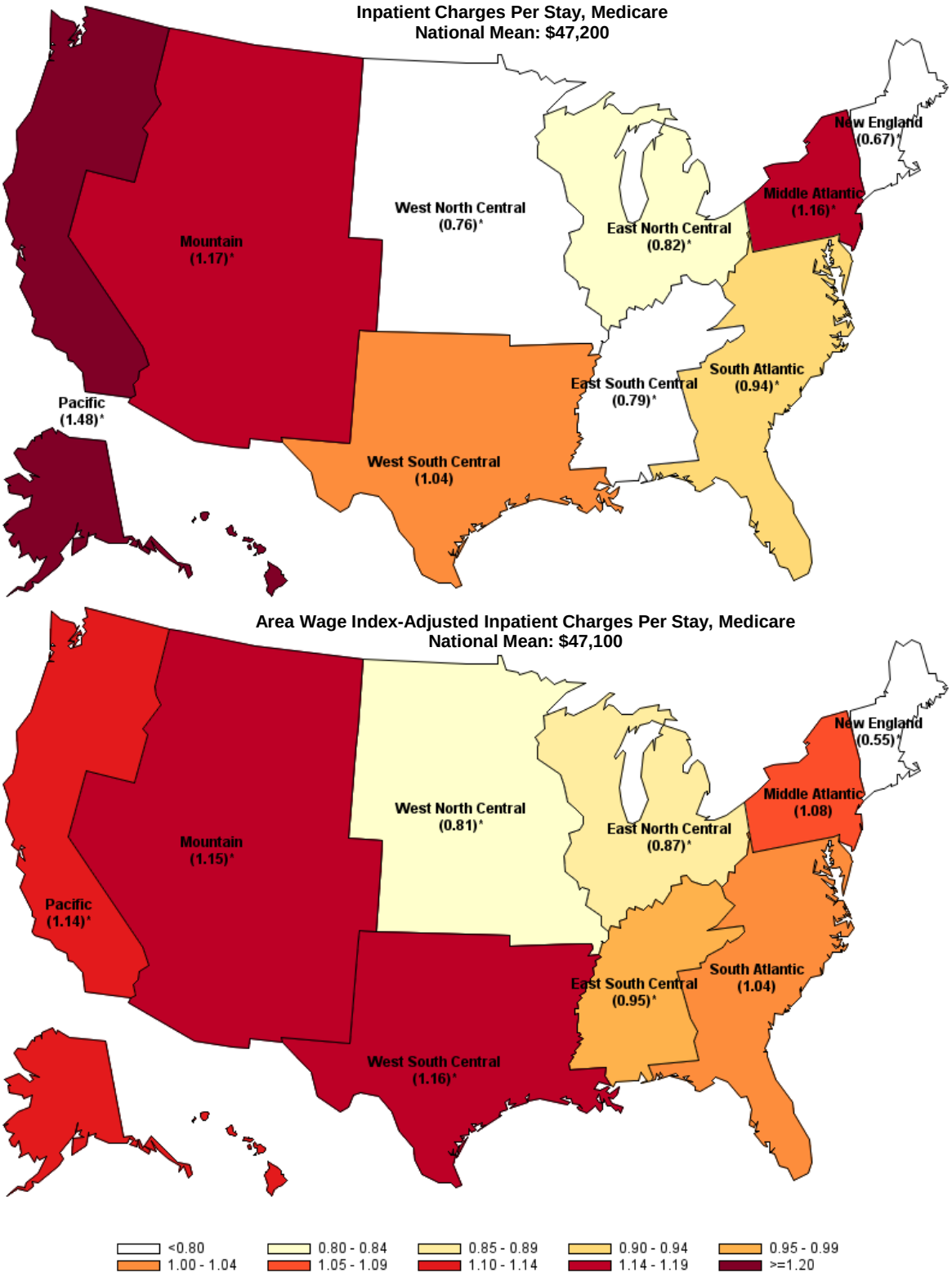
  In 2013, three census divisions had mean inpatient charges per stay that were higher than the national mean of $39,500 per stay: Pacific (37 percent higher), Middle Atlantic (16 percent higher), and Mountain (10 percent higher). Five divisions had mean inpatient charges per stay that were lower than the national mean: New England (27 percent lower), West North Central (23 percent lower), East South Central (17 percent lower), East North Central (16 percent lower), and South Atlantic (8 percent lower). Mean inpatient charges per stay in the West South Central division did not differ significantly from the national mean.

- **The variation in AWI-adjusted mean inpatient charges per stay across census divisions in 2013 remained but was lower than unadjusted charges.**

  In 2013, three census divisions had AWI-adjusted mean inpatient charges per stay that were higher than the AWI-adjusted national mean of $39,000 per stay: West South Central (12 percent higher), Mountain (9 percent higher), and Pacific (7 percent higher). Three divisions had AWI-adjusted mean inpatient charges per stay that were lower than the AWI-adjusted national mean: New England (40 percent lower), West North Central (18 percent lower), and East North Central (11 percent lower). AWI-adjusted mean inpatient charges per stay in the East South Central, South Atlantic, and Middle Atlantic divisions did not differ significantly from the AWI-adjusted national mean.

Mean inpatient charges for Medicare stays, by census division, 2013
Figure 2 displays the ratios of U.S. census division-level mean charges relative to the national mean values per hospital inpatient stay for Medicare stays, unadjusted and then adjusted by the AWI.

Figure 2. Ratio of mean inpatient charges per Medicare stay relative to the national Medicare mean by census division, unadjusted and adjusted by area wage index, 2013



*Statistically significant difference from 1.00 at the 0.05 level or better

Note: Divisions are color-coded to represent 5 percentage point bins above or below the national mean value.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2013

- **There was substantial variation in mean inpatient charges per Medicare stay across census divisions in 2013.**

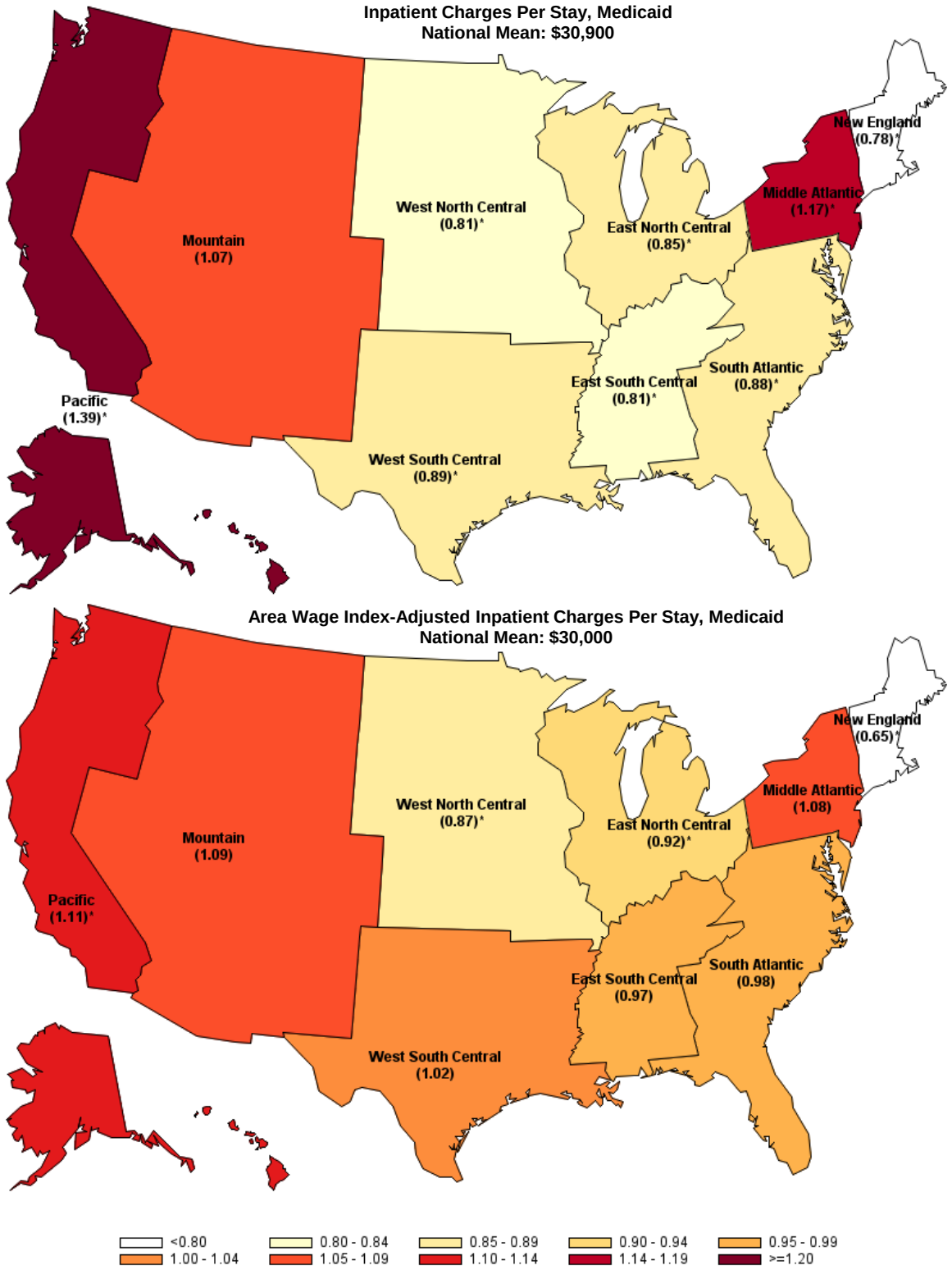
  In 2013, the mean hospital inpatient charges per Medicare stay in three U.S. census divisions were higher than the national Medicare mean of $47,200 per stay: Pacific (48 percent higher), Mountain (17 percent higher), and Middle Atlantic (16 percent higher). Five divisions had mean hospital inpatient charges per stay that were lower than the national mean: New England (33 percent lower), West North Central (24 percent lower), East South Central (21 percent lower), East North Central (18 percent lower), and South Atlantic (6 percent lower). Mean hospital inpatient charges per Medicare stay in the West South Central division did not differ significantly from the national Medicare mean.

- **The variation in AWI-adjusted mean inpatient charges per Medicare stay across census divisions in 2013 remained but was lower than unadjusted charges.**

  In 2013, three census divisions had AWI-adjusted mean hospital inpatient charges per Medicare stay that were higher than the AWI-adjusted national Medicare mean of $47,100 per stay: West South Central (16 percent higher), Mountain (15 percent higher), and Pacific (14 percent higher). Four divisions had AWI-adjusted mean hospital inpatient charges per Medicare stay that were lower than the AWI-adjusted national Medicare mean: New England (45 percent lower), West North Central (19 percent lower), East North Central (13 percent lower), and East South Central (5 percent lower). AWI-adjusted mean hospital inpatient charges per Medicare stay in the South Atlantic and Middle Atlantic divisions did not differ significantly from the AWI-adjusted national Medicare mean.

Mean inpatient charges for Medicaid stays, by census division, 2013
Figure 3 displays the ratios of U.S. census division-level mean charges relative to the national mean values per hospital inpatient stay for Medicaid stays, unadjusted and then adjusted by the AWI.

Figure 3. Ratio of mean inpatient charges per Medicaid stay relative to the national Medicaid mean, by census division, unadjusted and adjusted by area wage index, 2013



*Statistically significant difference from 1.00 at the 0.05 level or better

Note: Divisions are color-coded to represent 5 percentage point bins above or below the national mean value.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2013

- **There was substantial variation in mean inpatient charges per Medicaid stay across census divisions in 2013.**

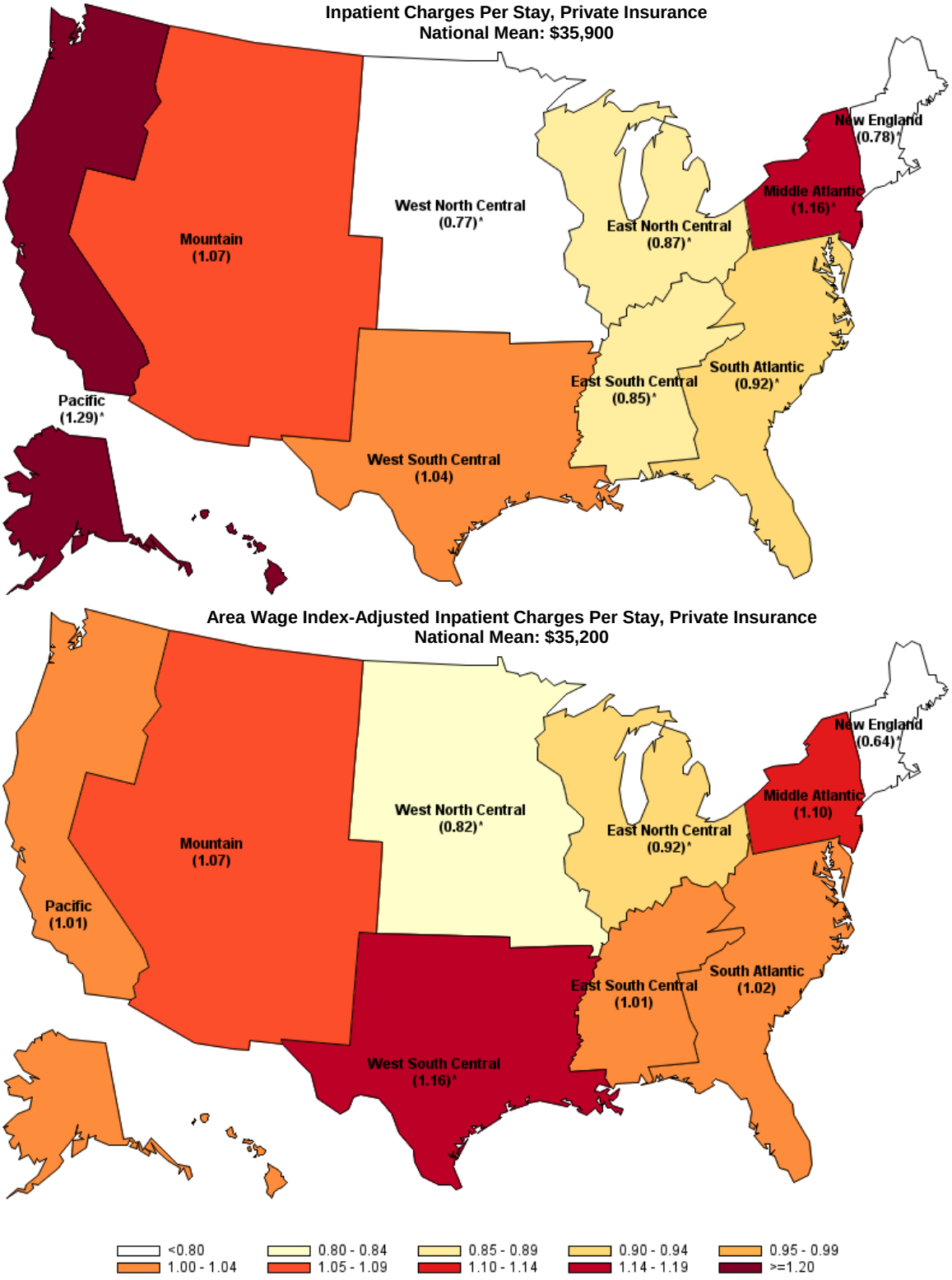
  In 2013, two census divisions had mean inpatient charges per Medicaid stay that were higher than the national Medicaid mean of $30,900 per stay: Pacific (39 percent higher) and Middle Atlantic (17 percent higher). Six divisions had mean inpatient charges per Medicaid stay that were lower than the national Medicaid mean: New England (22 percent lower), West North Central (19 percent lower), East South Central (19 percent lower), East North Central (15 percent lower), South Atlantic (12 percent lower), and West South Central (11 percent lower). Mean inpatient charges per Medicaid stay in the Mountain division did not differ significantly from the national Medicaid mean.

- **The variation in AWI-adjusted mean inpatient charges per Medicaid stay across census divisions in 2013 remained but was lower than unadjusted charges.**

  In 2013, the AWI-adjusted mean inpatient charges per Medicaid stay in the Pacific division were 11 percent higher than the AWI-adjusted national Medicaid mean of $30,000 per stay. Three divisions had AWI-adjusted mean inpatient charges per Medicaid stay that were lower than the AWI-adjusted national Medicaid mean: New England (35 percent lower), West North Central (13 percent lower), and East North Central (8 percent lower). AWI-adjusted mean inpatient charges per Medicaid stay in the South Atlantic, Middle Atlantic, East South Central, West South Central, and Mountain divisions did not differ significantly from the AWI-adjusted national Medicaid mean.

Mean inpatient charges for privately insured stays, by census division, 2013
Figure 4 displays the ratios of U.S. census division-level mean charges relative to the national mean values per hospital inpatient stay for privately insured stays, unadjusted and then adjusted by the AWI.

Figure 4. Ratio of mean inpatient charges per privately insured stay relative to the national privately insured mean, by census division, unadjusted and adjusted by area wage index, 2013



*Statistically significant difference from 1.00 at the 0.05 level or better

Note: Divisions are color-coded to represent 5 percentage point bins above or below the national mean value.

Source: Agency for Healthcare Research and Quality (AHRQ), Center for Delivery, Organization, and Markets, Healthcare Cost and Utilization Project (HCUP), National Inpatient Sample (NIS), 2013

- **There was substantial variation in mean inpatient charges per privately insured stay across census divisions in 2013.**

  In 2013, two census divisions had mean inpatient charges per privately insured stay that were higher than the national privately insured mean of $35,900 per stay: Pacific (29 percent higher) and Middle Atlantic (16 percent higher). Five divisions had mean inpatient charges per privately insured stay that were lower than the national privately insured mean: West North Central (23 percent lower), New England (22 percent lower), East South Central (15 percent lower), East North Central (13 percent lower), and South Atlantic (8 percent lower). Mean inpatient charges per privately insured stay in the Mountain and West South Central divisions did not differ significantly from the national privately insured mean.

- **The variation in AWI-adjusted mean inpatient charges per privately insured stay across census divisions in 2013 remained but was lower than unadjusted charges.**

  In 2013, the AWI-adjusted mean inpatient charges per privately insured stay in the West South Central division were 16 percent higher than the AWI-adjusted national privately insured mean of $35,200 per stay. Three divisions had AWI-adjusted mean inpatient charges per privately insured stay that were lower than the AWI-adjusted national privately insured mean: New England (36 percent lower), West North Central (18 percent lower), and East North Central (8 percent lower). AWI-adjusted mean inpatient charges per privately insured stay in the South Atlantic, East South Central, Middle Atlantic, Mountain, and Pacific divisions did not differ significantly from the AWI-adjusted national privately insured mean.

Data Source

The estimates in this Statistical Brief are based upon data from the Healthcare Cost and Utilization Project (HCUP) 2013 National Inpatient Sample (NIS). All differences between estimates noted in the text are statistically significant at the 0.05 level or better.

Definitions

Types of hospitals included in the HCUP National Inpatient Sample
The National Inpatient Sample (NIS) is based on data from community hospitals, which are defined as short-term, non-Federal, general, and other hospitals, excluding hospital units of other institutions (e.g., prisons). The NIS includes obstetrics and gynecology, otolaryngology, orthopedic, cancer, pediatric, public, and academic medical hospitals. Excluded are long-term care facilities such as rehabilitation, psychiatric, and alcoholism and chemical dependency hospitals. Beginning in 2012, long-term acute care hospitals are also excluded. However, if a patient received long-term care, rehabilitation, or treatment for a psychiatric or chemical dependency condition in a community hospital, the discharge record for that stay will be included in the NIS.

Unit of analysis
The unit of analysis is the hospital discharge (i.e., the hospital stay), not a person or patient. This means that a person who is admitted to the hospital multiple times in 1 year will be counted each time as a separate discharge from the hospital.

Charges
Charges represent the amount a hospital billed for the case. Hospital charges reflect the amount the hospital billed for the entire hospital stay and do not include professional (physician) fees. For the purposes of this Statistical Brief, charges are reported to the nearest hundred.

Area wage index
The area wage index is an index computed by the Centers for Medicare & Medicaid Services (CMS) to measure the relative hospital wage level in a geographic area compared with the national average hospital wage level. It is provided on the HCUP Cost-to-Charge (CCR) file to allow researchers to analyze cost differences geographically or to control for price factors beyond the hospital's control.[7]

Payer
Payer is the expected payer for the hospital stay. To make coding uniform across all HCUP data sources, payer combines detailed categories into general groups:

- Medicare: includes patients covered by fee-for-service and managed care Medicare
- Medicaid: includes patients covered by fee-for-service and managed care Medicaid
- Private Insurance: includes Blue Cross, commercial carriers, and private health maintenance organizations (HMOs) and preferred provider organizations (PPOs)
- Uninsured: includes an insurance status of *self-pay* and *no charge*
- Other: includes Workers' Compensation, TRICARE/CHAMPUS, CHAMPVA, Title V, and other government programs.

Hospital stays billed to the State Children's Health Insurance Program (SCHIP) may be classified as Medicaid, Private Insurance, or Other, depending on the structure of the State program. Because most State data do not identify patients in SCHIP specifically, it is not possible to present this information separately.

For this Statistical Brief, when more than one payer is listed for a hospital discharge, the first-listed payer is used.

[7] Agency for Healthcare Research and Quality. HCUP Cost-to-Charge Ratio (CCR) Files. Healthcare Cost and Utilization Project (HCUP). 2013. Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2015. http://www.hcup-us.ahrq.gov/db/state/costtocharge.jsp. Accessed February 17, 2016.

Division
Division corresponds to the location of the hospital and is one of the nine divisions defined by the U.S. Census Bureau:

- New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
- Middle Atlantic: New York, New Jersey, Pennsylvania
- East North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin
- West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas
- South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida
- East South Central: Kentucky, Tennessee, Alabama, Mississippi
- West South Central: Arkansas, Louisiana, Oklahoma, Texas
- Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada
- Pacific: Washington, Oregon, California, Alaska, Hawaii

About HCUP

The Healthcare Cost and Utilization Project (HCUP, pronounced "H-Cup") is a family of health care databases and related software tools and products developed through a Federal-State-Industry partnership and sponsored by the Agency for Healthcare Research and Quality (AHRQ). HCUP databases bring together the data collection efforts of State data organizations, hospital associations, and private data organizations (HCUP Partners) and the Federal government to create a national information resource of encounter-level health care data. HCUP includes the largest collection of longitudinal hospital care data in the United States, with all-payer, encounter-level information beginning in 1988. These databases enable research on a broad range of health policy issues, including cost and quality of health services, medical practice patterns, access to health care programs, and outcomes of treatments at the national, State, and local market levels.

HCUP would not be possible without the contributions of the following data collection Partners from across the United States:

Alaska State Hospital and Nursing Home Association
Arizona Department of Health Services
Arkansas Department of Health
California Office of Statewide Health Planning and Development
Colorado Hospital Association
Connecticut Hospital Association
District of Columbia Hospital Association
Florida Agency for Health Care Administration
Georgia Hospital Association
Hawaii Health Information Corporation
Illinois Department of Public Health
Indiana Hospital Association
Iowa Hospital Association
Kansas Hospital Association
Kentucky Cabinet for Health and Family Services
Louisiana Department of Health and Hospitals
Maine Health Data Organization
Maryland Health Services Cost Review Commission
Massachusetts Center for Health Information and Analysis
Michigan Health & Hospital Association
Minnesota Hospital Association
Mississippi Department of Health
Missouri Hospital Industry Data Institute
Montana MHA - An Association of Montana Health Care Providers
Nebraska Hospital Association
Nevada Department of Health and Human Services

New Hampshire Department of Health & Human Services
New Jersey Department of Health
New Mexico Department of Health
New York State Department of Health
North Carolina Department of Health and Human Services
North Dakota (data provided by the Minnesota Hospital Association)
Ohio Hospital Association
Oklahoma State Department of Health
Oregon Association of Hospitals and Health Systems
Oregon Office of Health Analytics
Pennsylvania Health Care Cost Containment Council
Rhode Island Department of Health
South Carolina Revenue and Fiscal Affairs Office
South Dakota Association of Healthcare Organizations
Tennessee Hospital Association
Texas Department of State Health Services
Utah Department of Health
Vermont Association of Hospitals and Health Systems
Virginia Health Information
Washington State Department of Health
West Virginia Health Care Authority
Wisconsin Department of Health Services
Wyoming Hospital Association

About Statistical Briefs

HCUP Statistical Briefs are descriptive summary reports presenting statistics on hospital inpatient and emergency department use and costs, quality of care, access to care, medical conditions, procedures, patient populations, and other topics. The reports use HCUP administrative health care data.

About the NIS

The HCUP National Inpatient Sample (NIS) is a national database of hospital inpatient stays. The NIS is nationally representative of all community hospitals (i.e., short-term, non-Federal, nonrehabilitation hospitals). The NIS includes all payers. It is drawn from a sampling frame that contains hospitals comprising more than 95 percent of all discharges in the United States. The vast size of the NIS allows the study of topics at the national and regional levels for specific subgroups of patients. In addition, NIS data are standardized across years to facilitate ease of use. Over time, the sampling frame for the NIS has changed; thus, the number of States contributing to the NIS varies from year to year. The NIS is intended for national estimates only; no State-level estimates can be produced.

The 2012 NIS was redesigned to optimize national estimates. The redesign incorporates two critical changes:

- Revisions to the sample design—starting with 2012, the NIS is now a *sample of discharge records from all HCUP-participating hospitals*, rather than a sample of hospitals from which all discharges were retained (as is the case for NIS years before 2012).

- Revisions to how hospitals are defined—the NIS now uses the *definition of hospitals and discharges supplied by the statewide data organizations* that contribute to HCUP, rather than the definitions used by the American Hospital Association (AHA) Annual Survey of Hospitals.

The new sampling strategy is expected to result in more precise estimates than those that resulted from the previous NIS design by reducing sampling error: for many estimates, confidence intervals under the new design are about half the length of confidence intervals under the previous design. The change in sample design for 2012 necessitates recomputation of prior years' NIS data to enable analyses of trends that use the same definitions of discharges and hospitals.

For More Information

For more information about HCUP, visit http://www.hcup-us.ahrq.gov/.

For additional HCUP statistics, visit HCUP Fast Stats at http://www.hcup-us.ahrq.gov/faststats/landing.jsp for easy access to the latest HCUP-based statistics for health information topics, or visit HCUPnet, HCUP's interactive query system, at http://hcupnet.ahrq.gov/.

For information on other hospitalizations in the United States, refer to the following HCUP Statistical Briefs located at http://www.hcup-us.ahrq.gov/reports/statbriefs/statbriefs.jsp:

- Statistical Brief #180, Overview of Hospital Stays in the United States, 2012
- Statistical Brief #181, Costs for Hospital Stays in the United States, 2012
- Statistical Brief #186, Most Frequent Operating Room Procedures Performed in U.S. Hospitals, 2003–2012
- Statistical Brief #162, Most Frequent Conditions in U.S. Hospitals, 2011

For a detailed description of HCUP and more information on the design of the National Inpatient Sample (NIS), please refer to the following database documentation:

Agency for Healthcare Research and Quality. Overview of the National (Nationwide) Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP). Rockville, MD: Agency for Healthcare Research and Quality. Updated November 2015. http://www.hcup-us.ahrq.gov/nisoverview.jsp. Accessed February 17, 2016.

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AHRQ welcomes questions and comments from readers of this publication who are interested in obtaining more information about access, cost, use, financing, and quality of health care in the United States. We also invite you to tell us how you are using this Statistical Brief and other HCUP data and tools, and to share suggestions on how HCUP products might be enhanced to further meet your needs. Please e-mail us at hcup@ahrq.gov or send a letter to the address below:

David Knutson, Director
Center for Delivery, Organization, and Markets
Agency for Healthcare Research and Quality
5600 Fishers Lane
Rockville, MD 20857

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